

REMARKS

Summary of the Official Action

The foregoing Amendment and remarks which follow are responsive to the Office Action mailed March 15, 2004. In that Office Action, the Examiner rejected Claims 1, 3-6, 8, 10-13, 16, 21-23 and 29-32 under 35 U.S.C. § 103(a) as being unpatentable over Honma (6,335,699).

Claims 2 and 28 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Honma in view of Allen et al. (6,661,368). Claims 7, 9, 14-15, 17-20 and 24-27 were objected to as being dependent upon a rejected base claim, but were indicated as being allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Summary of Applicant's Response

Applicant has amended Claims 1 and 23, cancelled Claim 6, and added new independent Claims 33-35 and 41 to clarify the invention and incorporate subject matter which is believed to be allowable over the relevant prior art references cited thereagainst. The proposed amendments are not believed to add new matter or necessitate further searching.

The Present Invention as Recited in Amended Independent Claims 1 and 23 & Added Independent Claims 33-35 and 41

Amended independent Claims 1 and 23 have been amended to incorporate the feature of cancelled Claim 6. New independent Claim

33 comprises a combination of the limitations originally set forth in Claims 1, 6 and 7. Due to Claim 7 having been deemed to include allowable subject matter, Applicant respectfully submits that new independent Claim 33 is in condition for allowance.

New independent Claim 34 comprises a combination of the limitations originally set forth in Claims 1, 8 and 9. Due to Claim 9 having been deemed to include allowable subject matter, Applicant respectfully submits that new independent Claim 34 is in condition for allowance. New independent Claim 35 comprises a combination of the limitations originally set forth in Claims 1 and 14. Due to Claim 14 having been deemed to include allowable subject matter, Applicant respectfully submits that new independent Claim 35 is in condition for allowance as are new Claims 36-40 which are dependent thereon and which are analogous in scope to Claims 15 and 17-20, respectively, which were also deemed to include allowable subject matter.

New independent Claim 41 comprises a combination of the limitations originally set forth in Claims 23 and 24. Due to Claim 24 having been deemed to include allowable subject matter, Applicant respectfully submits that new independent Claim 41 is in condition for allowance, as are Claims 43-45, which are analogous in scope to Claims 25-27, respectively, and which were also deemed to include allowable subject matter.

As recited in each of the independent claims as amended and added, the present invention is directed to a radar system which

features a protective member for protecting a radar compartment from a transmitted radar beam. In its broadest sense, the radar system comprises an antenna, an alignment member and the protective member.

The antenna has a transmitter surface for transmitting the radar beam. The protective member has an outer protective surface and is externally located adjacent the antenna for protecting the radar compartment from the transmitted radar beam. The protective member is fabricated from a material substantially transparent to the radar beam.

The alignment member is disposed between the antenna and the protective member. The alignment member is sized and configured to align the transmitter surface towards the outer protective surface for transmission of the radar beam therethrough. Importantly, the protective member is positioned and configured such that an operating frequency of any portion of the transmitted radar beam that may be diffracted from the outer protective surface is mitigated in order to protect the radar compartment from the radar beam.

Applicant emphasizes that the radar system is specifically configured and oriented relative to the antenna in order to protect the radar compartment from the harmful effects of the dielectric portion of the transmitted radio frequency beam. Through the unique arrangement of the antenna, the alignment member and the protective member, the protective member as used in the present invention may optimally mitigate an operating frequency of any portion of the transmitted radar beam that may be diffracting from the outer

protective surface.

More particularly, the radar system of the present invention features (1) the protective member being fabricated from a material substantially transparent to the radar beam and (2) being configured such that an operating frequency of any portion of the transmitted radar beam diffracting back towards the radar compartment from the outer protective surface is mitigated to protect the radar compartment from the diffracted portion of the transmitted radar beam.

The Prior Art In View Of The Present Invention

Applicant submits that, as understood, the cited prior art references, when taken either alone or in any proper combination, do not teach or suggest the emphasized feature of the present invention of, namely, the protective member having the combined characteristics of (1) being fabricated from a material substantially transparent to the radar beam and (2) being arranged relative to the antenna such that the protective member mitigates (i.e., absorbs) transmitted radar beams that may be diffracted back towards the radar compartment.

Rejection Under 35 U.S.C. 103(a)

Claims 1, 3-6, 8, 10-13, 16, 21-23 and 29-32 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Honma.

In rejecting each of the independent claims under § 103(a),

the Examiner indicates that Honma discloses "a radar system 10, an antenna 2 having a transmitting the radar beam, a protective member (radome) having an outer protective surface 13 and being externally located adjacent the antenna (radome) [such that] the operating frequency of any portion of the transmitted radar beam diffracting from the outer protective surface is mitigated (absorbed) to protect the radar compartment therefrom". The Examiner also indicates that "Honma is silent about the alignment member. However ... there must be (inherent) an alignment member disposed between the antenna and the protective member (radome)...[and] if not inherent...it would be obvious to include such alignment member to align the transmitter 2 and the protective member...". (See, Office Action, page 2). However, even agreeing with the Examiner's position, Applicant nonetheless maintains a belief in the patentability of the present invention.

First, as understood, Honma does not feature a protective member having the combined characteristics of (1) being fabricated from a material substantially transparent to the radar beam and (2) being arranged such that the protective member mitigates (i.e., absorbs) transmitted radar beams that may be diffracted back towards the radar compartment. Rather, Honma is believed to disclose a wholly different radar system. More specifically, the radome of Honma (the functional equivalent to the protective member of Applicant's invention) is configured to *prevent or block external* radio waves of a particular frequency from passing *inwardly* therethrough by selectively

activating a dielectric layer formed in the radome to change the dielectric field thereof so as to cause refraction at the radome.

In contrast, the protective member of Applicant's invention is configured to *mitigate or absorb diffracted internal radio waves* that are being *outwardly* transmitted by the antenna.

Honma recites that the "radome 10 includes: a pair of glass plates 11 disposed with a predetermined spacing...a liquid crystal layer 12 functioning as a dielectric layer... sealed between the...glass plates...and control electrode layers 13...formed in a frame shape and disposed on an upper and lower surface of the...glass plates." (Col. 3, Lines 1-8). When "voltage [is] applied between the control electrode layers 13 by the power source 9...the permittivity of the liquid crystal layer 12 changes when [an] electric field arises between the control electrode layers 13...in the "controlled state"". (Col. 3, Lines 13-19). "[T]he state in which voltage is not being applied ...is called the "non-controlled state"". (Col. 20-23). Depending on the particular embodiment of the radome in Honma, "in the controlled state...reflection by the radome 10 of the radio waves ... is reduced, permitting passage of radio waves having the frequency used by the radar antenna 2 with minimal loss." (Col. 3, Lines 34-37).

As is further recited in Honma, "Thus, even if external radio waves have the same frequency as the working frequency arrive, the external radio waves are blocked by the radome 10 and prevented from reaching the radar antenna 2. Consequently, interference in the

radar antenna 2 due to the arrival of external radio waves is reduced, enabling the occurrence of malfunctions to be suppressed". (Col. 3, Lines 57-61).

Applicant understands the above-recited statements in Honma regarding the protective member to be an indication that the radome (the functional equivalent of the protective member of Applicant's invention) only allows passage of radio waves therethrough when the permittivity of the liquid crystal layer (i.e., the dielectric layer) changes in response to a voltage being applied between the control electrode layers by the power source. In this regard, Applicant understands Honma to only allow passage (or blocking, depending on the embodiment) of external radio waves depending on the state of the permittivity of the radome at a particular point in time, and not based upon the static (i.e., unchanging) properties of the radome materials.

More specifically, Applicant understands Honma to disclose a radome that is *fabricated of a material that is only selectively transparent to external radar beams*, depending on whether or not voltage is applied to the control electrode layers. Therefore, Honma fails to disclose the present invention's protective member that is continuously and *"substantially transparent to the radar beam"*, as is recited in amended independent Claims 1 and 23 and new independent Claim 33. Because Honma expressly notes that the protective member is only selectively transparent, Applicant respectfully submits that having a protective member that is

fabricated of material which is substantially transparent to the radar beam and which is arranged relative to the antenna such that the protective member mitigates (i.e., absorbs) transmitted radar beams that may be diffracted back towards the radar compartment is not achieved in Honma.

Secondly, even assuming that the radome of Honma inherently includes an alignment member or that it would be obvious to include such alignment member to align the transmitter (i.e., the antenna) with the protective member, Applicant respectfully submits that the combination of the protective member, alignment member and antenna would not result in Applicant's invention. For example, as was noted above, Honma expressly states that "the radome...prevents penetration by external radio waves having the same frequency as the radio waves used by the radar device". (Col. 2, Lines 8-10).

More importantly, Honma states that "In order to achieve the above object...[the] radome...has a dielectric layer whose relative permittivity is changed by the application of an electric field...". (Col. 2, Lines 11-14).

Based on the foregoing, Applicant understands Honma to teach a means for *preventing or blocking* external radio waves from entering into the radar compartment, and not to provide a means to protect the radar compartment by mitigating (i.e., absorbing) radar beams that are outwardly transmitted by the antenna and which may be *diffracted* at the outer protective surface, as is provided by the radar system of Applicant's invention.

Therefore, the present invention is clearly distinguishable from Honma. On these bases, Applicant respectfully submits that the proposed independent Claims 1 and 11, as amended, and new independent Claims 33-35 and 41 are unobvious in view of the cited prior art references. As such, the claims depending from Claim 1, namely Claims 2-5 and 7-22 are also believed to be patentable over the cited and applied references. In addition, the claims depending from amended Claim 23, namely Claims 24-32, are believed to be patentable over the cited and applied references. With regard to the added limitation of amended Claims 1 and 23, Applicant submits that no new matter is added as such limitation was included in cancelled Claim 6 as originally filed.

Request for Allowance


In view of the foregoing, the application is believed to be in condition for allowance. Entry of the amendments and issuance of a Notice of Allowance is therefore respectfully requested. Should the Examiner have any suggestions for expediting allowance of the application, please contact Applicant's representative at the telephone number listed below.

If any additional fee is due, please charge deposit account
19-4330.

Respectfully submitted,

Date: April 26, 2004

By:



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